

Vitamin D Information Sheet

What is Vitamin D?

Vitamin D is a fat-soluble vitamin that is naturally present in a few foods, and is produced endogenously when ultraviolet (UV) rays from sunlight trigger vitamin D synthesis. Vitamin D promotes calcium absorption and maintains adequate serum calcium and phosphate concentrations for normal bone mineralization. It is required for normal bone growth and remodeling. Vitamin D also plays a role in the reduction of inflammation, modulation of cell growth, neuromuscular and immune function, and glucose metabolism (1).

What are vitamin D food sources?

Only a few foods naturally contain vitamin D, particularly the flesh of fatty fish (e.g. trout, salmon, tuna) and fish liver oils. Beef liver, cheese and egg yolks contain small amounts of vitamin D, but the animal's diet also affects the amount of vitamin D in its tissues (2).

Most of the vitamin D from food sources is through the consumption of fortified foods. Most cow's milk in the US is fortified with ~3 mcg/cup, and plant-based milk alternatives also often contain similar amounts of added vitamin D. Other commonly fortified foods include cereals, yogurt, orange juices, and margarine. The fortification of infant formula is mandatory in both the US and Canada. Dietary supplements are also a source of vitamin D, particularly in infants who are not receiving fortified infant formula (2).

Vitamin D from the sun

Sun exposure is the source of at least some vitamin D for most people around the world. Type B UV radiation with a wavelength of 290-320 nm penetrates uncovered skin and triggers the synthesis of vitamin D.

How much vitamin D do I need?

Recommended dietary allowances for vitamin D are based on the assumption that individuals are receiving minimal sun exposure, although sunlight is the major source of vitamin D for some people. Infants require 10 mcg/day, while children and adults from 1-70 years require 15 mcg/day. The recommended dietary allowance for seniors over 70 years of age is 20 mcg/day (3).

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What are the signs of vitamin D deficiency?

Serum concentration of 25-OH vitamin D is the main indicator of vitamin D status. Serum levels of 20 ng/mL or more are generally sufficient for most individuals (2).

Diets low in vitamin D are more common in individuals whom have milk allergy or lactose intolerance, and those following a vegan diet (3). Low dietary intake, limited sun exposure, and poor vitamin D absorption can result in vitamin D deficiency. In children, this results in rickets, which is characterized by soft bones, skeletal deformities, failure to thrive, developmental delay, and dental abnormalities. In adults, vitamin D deficiency can lead to osteomalacia, which results in weak bones due to defective bone mineralization during the remodelling process. The symptoms of osteomalacia are similar to rickets (4).

Vitamin D deficiency is also associated with an increased risk of insulin resistance, high blood glucose, diabetes (5), and metabolic syndrome (6). This can also contribute to complications that affect the cardiovascular system, increased obesity risk, and hypertension (7). Lower vitamin D levels are also often observed in individuals suffering from inflammatory diseases, indicating a link between vitamin D and inflammation (8).

Where can I find more info?

Visit www.genetrackdiagnostics.com for full test information, including specimen collection requirements

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Email: support@genetrackdiagnostics.com
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NOTE:

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Who is at risk of vitamin D deficiency?

Breastfed infants are at increased risk of vitamin D deficiency, because human milk alone does not usually provide enough vitamin D to meet adequate intake levels. Older adults are also at increased risk of deficiency, partly because vitamin D synthesis in the skin reduces with age, and partly due to the fact that older adults are more likely to spend more time indoors (3).

Other populations at increased risk of deficiency include individuals with limited sun exposure and individuals with darker skin, as increased skin melanin reduces vitamin D synthesis (2).

Conditions that limit fat absorption (e.g. celiac disease, Crohn's disease) reduce the absorption of vitamin D in the gut, as it is a fat-soluble vitamin. Obesity is also associated with an increased risk of deficiency, as the increased subcutaneous fat in obese individuals sequesters more of the vitamin D synthesized from sun exposure (1).

References

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